

# Family Food Consumption Studies

By C. M. COONS, Ph.D.

It is a comfort to know that the Nation's supply of food appears to be sufficient in kind and amount, with some margins of safety, to meet the dietary requirements of its military and civilian populations. But it may be cause for concern and action to find that many families have poor diets under conditions of ample national supplies.

A major objective of family food consumption studies is to learn about socioeconomic and other conditions associated with low and high levels of food consumption and to study the importance of some of the factors affecting the nutritive adequacy of diets.

## National Food Surveys

The most recent national survey of family food consumption was that of urban families in the spring of 1948 (1, 2). Also, in 1948 and 1949, seasonal data were collected in four cities (Birmingham, Buffalo, Minneapolis-St. Paul, and San Francisco) representing different sections of the United States (3, 4).

For comparisons, consumption data were obtained in 1950 from a small sample of rural

families in the Minnesota area (5). About the same time, five southern States, cooperating with the Bureau of Human Nutrition and Home Economics, completed a joint survey of farm family food consumption in the cotton, tobacco, and mountain areas of the South (6). Data from national samples of both urban and rural families are available for 1942 (7). The largest survey of food consumption on a nation-wide basis was made in 1936 (8, 9).

The 1936, 1942, and 1948 studies were made during different economic cycles in this country. The first was near the end of the depression of the 1930's. The second was on the eve of rationing in World War II. The 1948 studies were conducted during a war recovery period of high level food consumption in the country as a whole.

For these studies, random samples of families reported to trained interviewers the quantities of food purchased, home-produced, or otherwise acquired, and consumed within a specified period, usually a week. Enough details were given as to the kind, form, quality of the food, and composition of the household to make possible computations of nutritive value, comparisons with recommended allowances for dietary adequacy, and analyses of variations in consumption. The analyses were designed to show the levels of consumption by different socioeconomic classifications of the families, to identify the low-consuming groups, and to reveal the effect of low consumption of important foods on the adequacy of diets.

## Comparisons of Food Consumed

Selected data from some of the analyses of food quantities consumed as reported in the

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*Dr. Coons, assistant chief of the Bureau of Human Nutrition and Home Economics of the United States Department of Agriculture, adapted the material for this paper in part from one presented at the Combined Conference on Administrative and Scientific Aspects of Food in Civil Defense, held in London, November 26 to December 13, 1951 (see Public Health Reports, July 1952, p. 607). Most of the data are taken from studies conducted by the Bureau of Human Nutrition and Home Economics.*

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1948 surveys are summarized in table 1. The first two lines of the table show the average national supply at retail for all consuming groups for the entire year of 1948 (10) in comparison with the quantities of food groups urban families consumed in the spring of 1948. Some differences would be expected from the nature of the two types of data. Citrus fruits, for example, were used in larger quantities by urban than by rural families, and grain products and sugar are used in greater quantities in winter than in other seasons. Even when based on data for all consuming groups the year around, the average per capita quantities of foods entering household kitchens would not be strictly comparable to those based on statistics of national food supplies at retail levels after allocations to military and foreign groups have been deducted. Some differences would

be expected because disproportionate amounts of a few commodities, for example, meats, go into commercial meals eaten by family members away from home, and other commodities, such as sugar, disappear into processed foods, including canned goods and bakery products.

More important than the average per capita figures for quantities of foods consumed, or for nutritive value of the diets of a national sample of families, is the magnitude of deviations from the average exhibited by subgroups and by individual families. Some of the variations are related to socioeconomic factors: income, household size and composition, seasons, urbanization, and national economic cycles, as shown in table 1 for foods consumed and in table 2 for nutrient content of diets. Different commodities and different nutrients are affected by the various factors studied. From these

**Table 1. Food consumption by families in different socioeconomic situations<sup>1</sup>**

[Pounds per person per week]

Socioeconomic factors (with income and household size <sup>2</sup> )	Leafy, green, yellow vegetables	Citrus fruits, tomatoes	Other vegetables, fruits	Dry beans, peas, nuts	Milk, cream, cheese, (milk equivalent)	Meat, poultry, fish, eggs	Fats, oils	Grain products (flour equivalent)	Sugars, sweets
United States, 1948:									
National supply, year average.....	2.25	2.04	6.83	0.29	10.38	3.94	1.25	3.29	2.04
Family consumption, urban, spring, \$3,606; 3.29 persons.....	2.23	3.45	6.05	.27	10.01	3.84	1.11	2.73	1.42
Income:									
Low, \$1,000-1,999, 3.23 persons....	2.00	2.96	5.16	.37	8.60	3.35	1.20	3.18	1.46
High, \$4,000-4,999, 3.50 persons....	2.56	3.76	6.62	.23	10.63	4.18	1.09	2.65	1.41
Household composition: <sup>3</sup>									
Without children.....	2.26	3.12	6.08	.28	9.72	4.17	1.27	2.93	1.43
With children.....	2.10	3.73	5.42	.23	11.14	3.76	.98	2.31	1.27
Region, winter, \$2,000-2,999:									
North (Minneapolis-St. Paul), 3.29 persons.....	1.74	3.37	6.30	.26	10.83	3.34	.99	2.64	1.30
South (Birmingham), 3.27 persons.....	1.92	2.82	5.01	.51	9.22	3.75	1.76	4.33	1.99
Season (Minneapolis-St. Paul): <sup>4</sup>									
Winter, \$3,277, 2.60 persons.....	2.16	4.15	6.95	.28	11.42	4.08	1.07	2.39	1.48
Fall, \$3,161, 2.47 persons.....	2.33	4.15	8.76	.20	10.40	4.09	1.10	2.26	1.43
Urbanization (Minnesota), spring: <sup>4</sup>									
Urban, 1949, \$4,020, 2.25 persons....	2.40	3.89	7.51	.22	11.78	4.58	1.17	2.36	1.42
Rural, 1950, \$2,000, 2.71 persons....	1.49	2.23	6.48	.28	13.26	4.86	1.50	3.26	1.97
Economic cycles, low-third incomes:									
1942, under \$1,736, 3.00 persons....	2.09	2.31	5.47	.35	7.37	2.67	1.14	2.96	.91
1948, under \$2,535, 3.28 persons....	2.12	3.07	5.35	.33	9.01	3.43	1.17	3.04	1.42

<sup>1</sup> Data compiled from various published and unpublished sources. See (11).

<sup>2</sup> Unless otherwise specified, figures are for consumption by urban families of the United States for 1 week in the spring of 1948. Average incomes, based on 1947 income after Federal income tax, are given for each group unless a specified income class is selected for the comparison.

<sup>3</sup> Data are for purchased quantities only, at similar average weekly food expense, \$7.21 and \$7.01 per person, for families without and with children. This occurred among families without children at incomes of \$2,000-2,999, 2.45 persons, and with children at \$5,000-7,499, 4.11 persons.

<sup>4</sup> Comparison based on selected family types.

analyses, it has become possible to know where, when, and at what foods or nutrients to look for underconsuming groups of families.

### Income and Family Diets

The effect of income on the adequacy of family diets is illustrated in figure 1 (11). In the spring of 1948, with incomes of \$1,000 to \$2,000, 50 percent of the urban families had diets meeting the National Research Council's allowance in calcium, 69 percent met NRC's allowance in ascorbic acid (vitamin C). With incomes of \$5,000 to \$7,500, 64 percent of the families met the allowance in calcium—88 percent in vitamin A.

Differences in the quantity of major foods making up these diets were even more marked

than the differences in their nutrient values, because, fortunately, many assortments of foods can combine to give an adequate diet.

Such figures show that income is an important factor in assuring an adequate diet and also that many low-income families do obtain needed quantities of important dietary essentials. The figures reveal also that adequate purchasing power does not necessarily mean adequate diet, since even high-income families had diets low in some essential nutrients.

The figures do point up the need for continued education to teach people how to obtain good diets and to convince them that something worth while might be gained by improving their customary food habits in line with the principles of good nutrition.

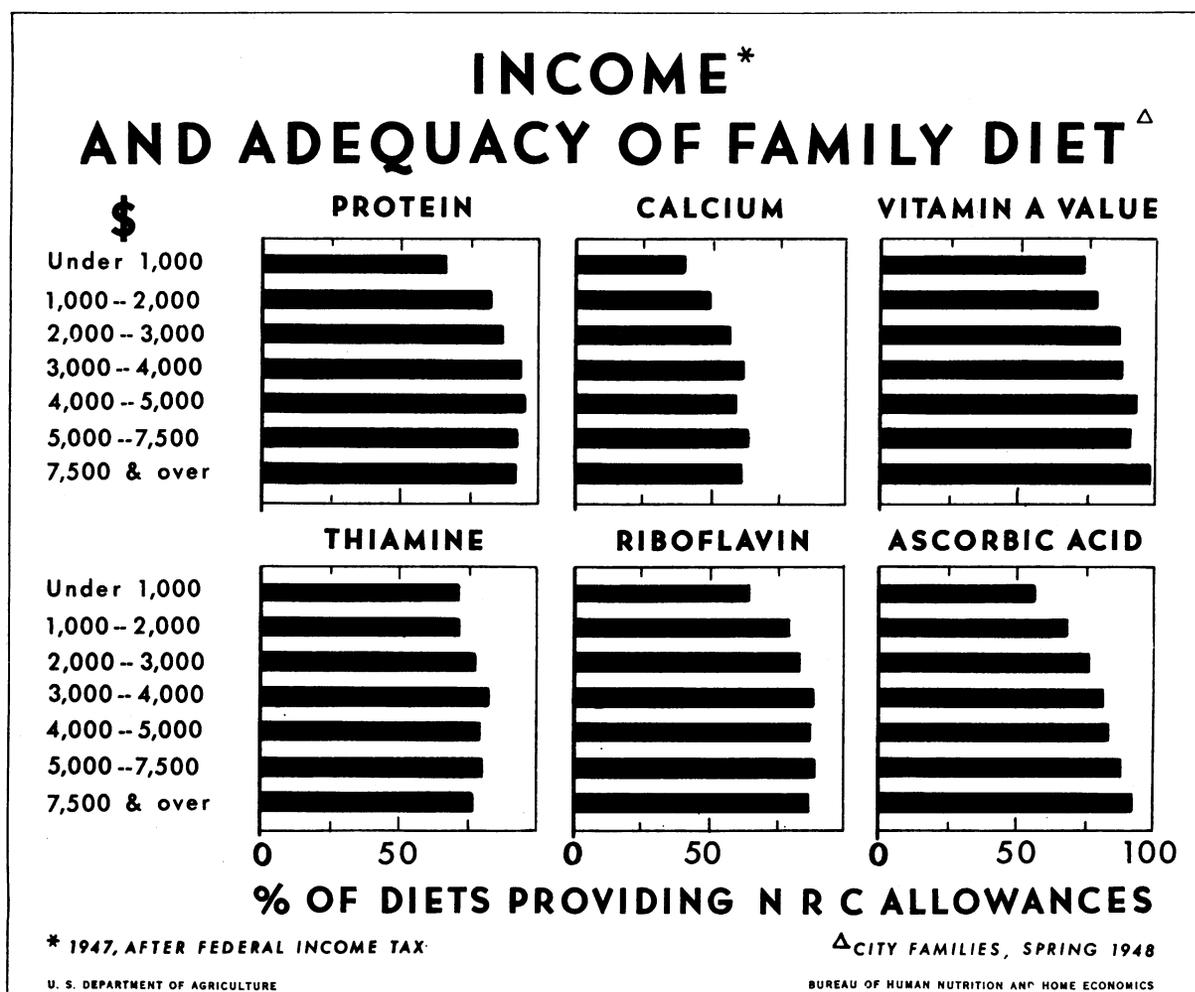
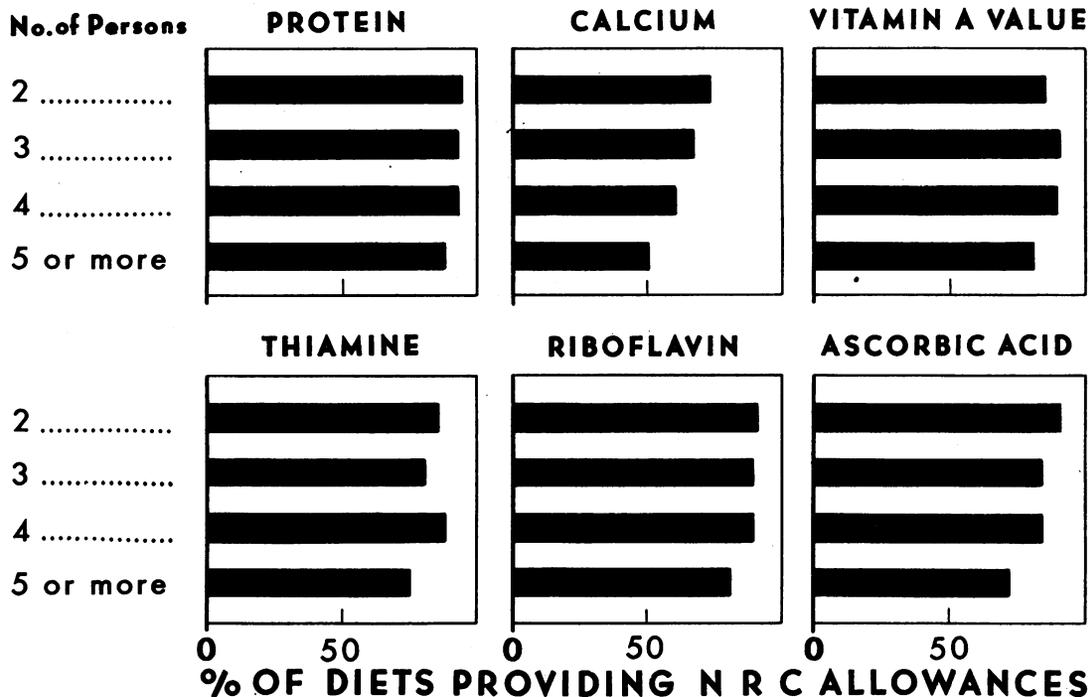


Figure 1.

# FAMILY SIZE AND ADEQUACY OF FAMILY DIET\*



\* CITY FAMILIES, \$3,000-\$4,000 INCOME, SPRING 1948

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Figure 2.

Differences in food habits associated with region and season made only small differences in adequacy of diets when incomes were comparable. Diets of rural families were particularly low in ascorbic acid due to low consumption of leafy green vegetables, citrus fruits, and tomatoes, but incomes were only about half those among urban families with better diets in the same area (tables 1 and 2).

### Family Size and Diets

The relation of family size to the adequacy of diets may be seen in figure 2 for a selected income group. In general, large families of five or more persons had poorer diets until income levels of more than \$4,000 were reached. The large families then had diets about as good as smaller families except for calcium content.

At every income level, fewer large families

had diets adequate in calcium. Families with children under 16 tended to have somewhat better diets than those with no children, except at the lowest income levels. Even at the lower end of the income distribution, where the purchasing power available per family member was small in the large families with children, it was surprising that the nutritive quality of their diets compared so favorably with that of the smaller, childless families.

### Education and Family Diet

The extent of the homemaker's education may explain some of the differences in skill of selecting good diets with a given income and expenditure for food (fig. 3). At less expense per person, college-educated homemakers obtained diets more adequate in all nutrients, particularly in calcium and ascorbic acid (vitamin C),

which are most often the limiting nutrients, than did homemakers of high school or elementary school education.

For example, in the spring of 1948, ascorbic acid was found adequate in 91 percent of the diets of urban families having homemakers with one or more years of college—in 83 percent

of those with high school education—and in 69 percent of those with only an elementary education. At that time, the average expense per person per week in 3-person families was \$7.12, \$7.52, and \$7.95 for families with homemakers of college, high school, and elementary school education, respectively.

**Table 2. Percentage of diets of families meeting National Research Council's allowances under different socioeconomic situations <sup>1</sup>**

Socioeconomic factors (with income and household size <sup>2</sup> )	Food energy (3,000 calories or more)	Protein (70 gm. or more)	Calcium (1.0 gm. or more)	Iron (12.0 mg. or more)	Vitamin A value (5,000 I. U. <sup>3</sup> or more)	Thiamine <sup>4</sup> (1.5 mg. or more)	Riboflavin <sup>4</sup> (1.8 mg. or more)	Niacin <sup>4</sup> (15 mg. or more)	Ascorbic acid <sup>4</sup> (75 mg. or more)
United States, 1948:									
Family consumption, urban, spring, \$3,606; 3.29 persons.....	79	89	58	87	86	78	84	80	79
Income:									
Low, \$1,000-1,999, 3.23 persons.....	77	83	50	86	78	72	79	78	69
High, \$4,000-4,999, 3.50 persons.....	83	95	59	88	94	79	88	86	83
Region, winter, \$2,000-2,999:									
North (Minneapolis-St. Paul), 3.29 persons.....	83	94	55	85	91	75	88	83	75
South (Birmingham), 3.27 persons.....	90	96	65	98	93	94	94	88	77
Season (Minneapolis-St. Paul): <sup>5</sup>									
Winter, \$3,277, 2.60 persons.....	88	93	68	90	95	78	88	83	87
Fall, \$3,161, 2.47 persons.....	81	90	56	86	92	78	80	82	84
Urbanization (Minnesota), spring: <sup>5</sup>									
Urban, 1949, \$4,020, 2.25 persons.....	92	95	68	93	96	86	88	90	85
Rural, 1950, \$2,000, 2.71 persons.....	82	95	69	90	84	83	91	77	51
Household size, \$2,000-2,999:									
2 persons.....	80	90	59	90	89	82	88	84	78
5 or more persons.....	62	72	39	80	76	71	67	69	60
Household composition: <sup>6</sup>									
Without children.....	75	89	55	88	88	80	85	79	75
With children.....	80	94	61	91	91	83	90	90	88
Education of homemaker, \$2,000-2,999:									
Elementary only, 3.63 persons.....	71	83	49	84	78	75	75	75	65
College, 3.12 persons.....	83	96	61	98	100	78	94	80	89

<sup>1</sup> Data compiled from various published and unpublished sources. See (11). The nutritive value per nutrition unit (physically active man) per day of the food consumed at home by each household was computed and then compared with the National Research Council's recommended allowances for a physically active man (revised 1948).

<sup>2</sup> Unless otherwise specified, figures are for consumption by urban families of the United States for 1 week in the spring of 1948. Average incomes, based on 1947 income after Federal income tax, are given for each group unless a specified income class is selected for the comparison.

<sup>3</sup> International units.

<sup>4</sup> Estimated average cooking losses for the three B-vitamins and for ascorbic acid (vitamin C) were deducted from the aggregate value of foods consumed.

<sup>5</sup> Comparison based on selected family types.

<sup>6</sup> Data are for purchased quantities only, at similar average weekly food expense of \$7.21 and \$7.01 per person for families without and with children. This occurred among families without children at incomes of \$2,000-2,999, 2.45 persons, and with children at \$5,000-7,499, 4.11 persons.

## Improvement in U. S. Diets

From 1942 to 1948, the improvement in diets occurred at all income levels but was most striking among the third of families with the lowest incomes. Some differences in food quantities consumed by the lowest income third are shown in the last two lines of table 1.

The impact of shifts in food choices in the 6-year period on over-all diet quality is best seen from a comparison of the nutritive values for diets of families in comparable income and family size groups, as shown in table 3 (2). In 1948, families in the lowest third of the income distribution had diets 14 to 35 percent higher in various nutrients (except vitamin A) than did corresponding families in 1942.

Higher calorie content of diets was attributable to greater use of vegetables, fruits, milk, eggs, meats, and sugar in 1948 than in 1942, more than offsetting a lower consumption of

potatoes and grain products. More calcium (20-percent increase for families of the lowest income third) was due to more milk in diets in 1948. More milk, eggs, and meats meant more protein, amounting to a 16-percent increase for families in the lowest third of incomes. A 16-percent increase also in ascorbic acid value of diets of families with lowest incomes was attributable to greater use of citrus, other fruits, and fresh vegetables. Families in the middle and highest income thirds had about the same or slightly less ascorbic acid in 1948 than in 1942.

Estimated quantities of three B-vitamins (thiamine, riboflavin, and niacin) were higher by 28 to 35 percent in diets of the third of families with lowest incomes in 1948 than in those of the lowest third in 1942. Increases of only 12 to 21 percent occurred for families in the middle and highest thirds. One reason for the greater gains of the lowest income third was

**Table 3. Nutritive value of diets, 1948 and 1942, by income—average nutritive value per nutrition unit per day of food consumed at home, urban housekeeping families of two or more persons, by income thirds, United States, spring 1948 and spring 1942<sup>1</sup>**

Year and income third	Food energy	Protein	Calcium	Iron	Vitamin A value	Thi-amine	Ribo-flavin	Niacin	Ascorbic acid
Average nutritive value of diets per nutrition unit per day									
<i>1948</i>	(calories)	(gm.)	(gm.)	(gm.)	(I. U.) <sup>2</sup>	(mg.)	(mg.)	(mg.)	(mg.)
All classes <sup>3</sup> -----	3, 800	102	1. 07	17. 5	10, 100	2. 36	2. 66	24. 1	165
Lowest third-----	3, 830	100	1. 02	17. 8	9, 700	2. 38	2. 58	23. 7	157
Middle third-----	3, 770	102	1. 09	17. 2	9, 900	2. 34	2. 69	23. 5	164
Highest third-----	3, 810	104	1. 10	17. 5	10, 800	2. 35	2. 72	25. 0	175
<i>1942</i>									
All classes-----	3, 520	92	0. 92	14. 5	9, 700	1. 90	2. 19	20. 0	162
Lowest third-----	3, 370	86	. 85	14. 2	8, 900	1. 79	2. 01	17. 5	135
Middle third-----	3, 590	95	. 97	14. 7	9, 900	1. 98	2. 28	20. 9	172
Highest third-----	3, 590	94	. 94	14. 7	10, 200	1. 94	2. 27	21. 7	180
Ratio: 1948/1942									
All classes-----	1. 08	1. 11	1. 16	1. 21	1. 04	1. 25	1. 21	1. 20	1. 02
Lowest third-----	1. 14	1. 16	1. 20	1. 25	1. 09	1. 33	1. 28	1. 35	1. 16
Middle third-----	1. 05	1. 07	1. 12	1. 17	1. 00	1. 18	1. 18	1. 12	. 95
Highest third-----	1. 06	1. 11	1. 17	1. 19	1. 06	1. 21	1. 20	1. 15	. 97

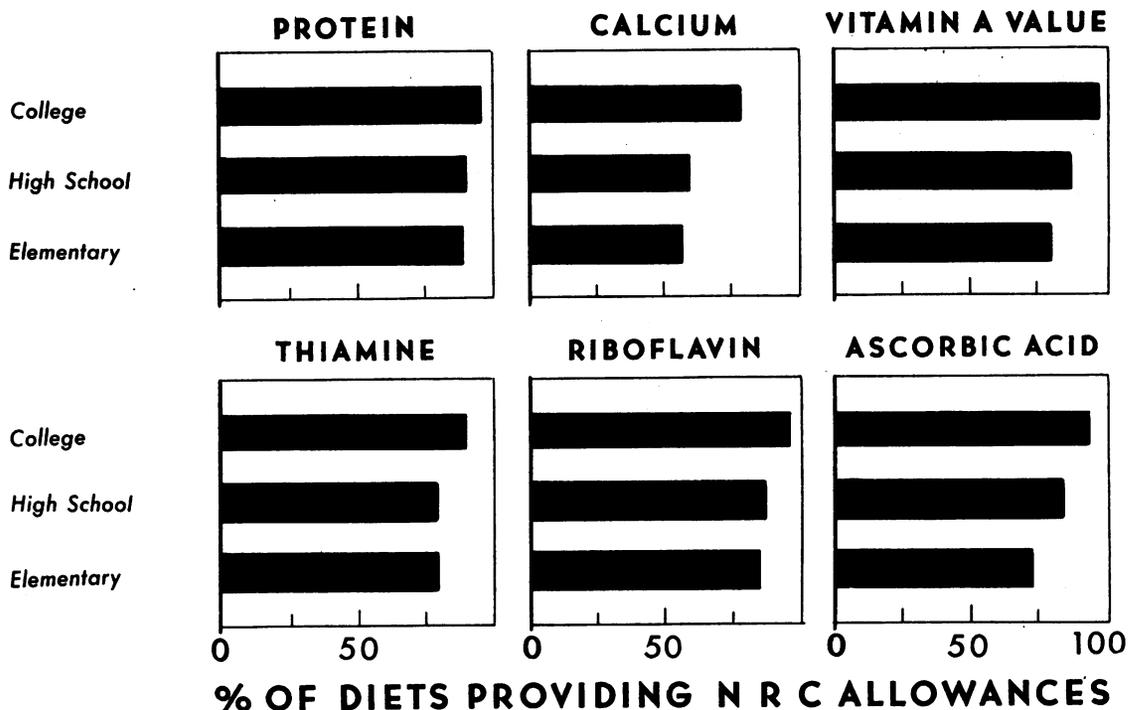
<sup>1</sup> Represents the nutritive value of food brought into the kitchen for household use per adult man (nutrition unit). No allowance has been made for losses that may occur during handling, cooking, or other kitchen prac-

tices, or for losses incurred during storage of left-overs.

<sup>2</sup> International units.

<sup>3</sup> Averages for 1948 exclude 147 families for whom no income data were obtained.

# EDUCATION OF HOMEMAKER\* AND ADEQUACY OF FAMILY DIET



\* CITY FAMILIES, \$3,000-\$4,000 INCOME, SPRING 1948

U. S. DEPARTMENT OF AGRICULTURE

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Figure 3.

their 20-percent increase in meat consumption compared to little or no change for the middle and highest thirds.

Another reason was the enrichment of white bread and flour, since grain products contribute a larger share of nutrients in diets of low-income families than in diets of high-income families. Even without enrichment of bread and flour, the amounts of iron and niacin in family diets in 1948 would, on the average, have been 8 percent higher, and thiamine would have been 11 percent higher, due to greater consumption of meats, poultry, eggs, and some vegetables and fruits.

Riboflavin would have been 18 percent higher in 1948 than in 1942 without the benefit of stepped-up enrichment, chiefly because of the increased consumption of milk and many milk

products. Enrichment was responsible for 11 percent of the iron and niacin averaged in urban diets in 1948, and for 14 percent of the thiamine, and 3 percent of the riboflavin (11). The effect of enrichment on the nutrient content of the national food supply during the war years and thereafter may be seen in figure 4.

## Conclusion

Surveys of family food consumption may be used as a basis for planning national and family food supplies, industrial and school lunch feeding, and nutrition education of families and individuals.

Whether the surveys are local, State, regional, or national, underconsuming groups are most likely found among low-income fam-



- (8) U. S. Department of Agriculture, Bureau of Home Economics: Family food consumption and dietary levels, five regions, farm series. Miscellaneous Publication No. 405, 1941.
- (9) U. S. Department of Agriculture, Bureau of Home Economics: Family food consumption and dietary levels, five regions, urban and village series. Miscellaneous Publication No. 452, 1941.
- (10) U. S. Department of Agriculture, Bureau of Agricultural Economics: Consumption of food in the United States, 1909-48, and Supplement, 1949. Miscellaneous Publication No. 691, 1949.
- (11) U. S. Department of Agriculture, Bureau of Human Nutrition and Home Economics: Nutritive content of city diets. Special Report No. 2, 1950. Processed.
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## New Heart Radio Series

"The Human Heart," a new series of eight quarter-hour dramatic radio transcriptions, is available for use in community health education. The series reports on progress in the treatment of various types of cardiovascular diseases.

The programs are designed for weekly broadcast over local radio stations by health departments and interested civic groups. Provision is made throughout the series for local live announcements of community sponsorship. Any one of the programs, however, may be used for nonbroadcast purposes—in classrooms, for instance.

Each transcription dramatizes a typical experience with a serious heart or circulatory ailment, as portrayed by a well-known radio or screen actor. Each story approaches the individual adjustment problem from a personal point of view—the doctor's or the patient's—that of the father, the mother, or the child. A brief commentary by a physician guest speaker ends the programs.

One program, "The Beautiful Noise," tells the story of a child born with a heart defect who becomes part of normal neighborhood life after an operation. Another, "A Matter of Strategy," tells how warning angina pains persuaded an explosive baseball manager to manage his team in a more relaxed fashion.

Sponsored by the Public Health Service, Federal Security Agency, the series was prepared under the auspices of the National Heart Institute and the Division of Chronic Disease and Tuberculosis, in the Public Health Service, and with the cooperation of the American Heart Association. It was produced and is being distributed by the Communication Materials Center, a division of Columbia University Press, 413 West 117th Street, New York 27, N. Y.